

IN THE CLAIMS:

Claim 1. (currently amended) A method of removing contaminants from a silicon wafer after a chemical-mechanical polishing operation, comprising:

providing a silicon wafer having a layer thereon;

performing a chemical-mechanical polishing process to remove a portion of the wafer; and

treating the silicon wafer with a buffer-polishing process using an aqueous solution of ozone.

~~performing a buffer polishing process by passing an aqueous solution of ozone over the silicon wafer.~~

Claim 2. (original) The method of claim 1, wherein a concentration of ozone in the aqueous solution is between 10 ppm and 200 ppm.

Claim 3. (cancelled)

Claim 4. (currently amended) The method of claim 1, wherein the step of treating the silicon wafer is performed by a water-cleaning process ~~buffer polishing process is conducted after a metallic layer chemical mechanical polishing process.~~

Claim 5. (currently amended) The method of claim 1, wherein the layer is selected from the group consisting of a low dielectric constant material layer, a metallic layer and a barrier layer ~~buffer polishing process is conducted after a barrier layer chemical mechanical polishing process.~~

Claim 6. (currently amended) The method of claim 1, wherein ~~before performing the buffer polishing process, the aqueous ozone~~

solution is catalyzed to produce more free ozone radicals therein.

Claim 7. (original) The method of claim 6, wherein the aqueous ozone solution is catalyzed by exposure to a beam of ultraviolet light or addition of hydrogen peroxide thereto.

Claims 8-20. (cancelled)

Claim 21. (new) A method of forming a damascene structure, comprising:

providing a substrate;

forming a dielectric layer over the substrate;

patterning the dielectric layer to form an opening that exposes a portion of the substrate;

forming a metallic layer over the substrate so that the opening is completely filled;

performing chemical-mechanical polishing to remove a portion of the metallic layer; and

treating the substrate using an aqueous solution of ozone and providing an inertial mechanical force so that contaminants on a surface of the substrate are removed.

Claim 22. (new) The method of claim 21, wherein a concentration of ozone in the aqueous solution is between about 10 ppm and 200 ppm.

Claim 23. (new) The method of claim 21, wherein the step of treating the substrate is performed by conducting a buffer-polishing process.

Claim 24. (new) The method of claim 21, wherein the step of treating the substrate is performed by a water-cleaning process.

Claim 25. (new) The method of claim 21, wherein the inertial mechanical force is between about 0.5 psi and 3 psi.

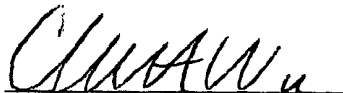
Claim 26. (new) The method of claim 21, further includes:

forming a barrier layer over the substrate, wherein the barrier layer is conformal to the surface profile of the substrate and covers the dielectric layer before forming a metallic layer process but after patterning the dielectric layer process; and

performing barrier layer chemical-mechanical polishing to remove a portion of the barrier layer and expose the dielectric layer after performing chemical-mechanical polishing process.

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Respectfully submitted,



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